



Striped iguana

(*Iguana iguana*)

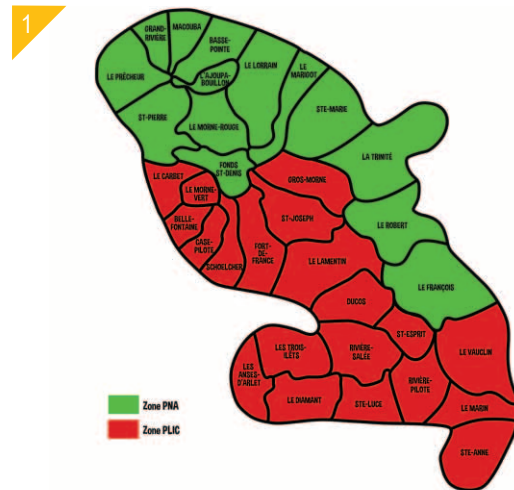
An effort to inform on striped iguanas, the main threat to the Lesser Antillean iguana on Martinique, by creating and running a travelling caravan intended to raise awareness among the general public

The Carbet des sciences

- This non-profit group, founded in 1993, is one of 30 scientific, technical and industrial information centres (CCSTI) in France, created by the Research ministry to promote the dissemination of knowledge and provide a wide public with a chance to learn about technical and scientific advances.
- The Carbet des sciences is the CCSTI for Martinique and is divided into several sections. The Ocean section raises awareness concerning the natural heritage, particularly threatened species in conjunction with the national action plans (PNA) for the Lesser Antillean iguana and the sea turtles of the French Caribbean. It is in the above framework that the group informs on certain invasive alien species (IAS) and their management.
- The group is a well-known partner for environmental managers on Martinique. Through information campaigns, it regularly contributes to conservation projects launched on the island.
- Contact: Mathilde Brassy, Head of the Ocean section
- mer.carbet.sciences@gmail.com

Intervention site

- The informational work can take place all over the island.
- However, certain towns have been designated as priority sites. They correspond to the areas targeted by the PNA for the Lesser Antillean iguana in the northern section of the island, on the flanks of the *Montagne Pelée*, a mountain where viable populations of the Lesser Antillean iguana (*Iguana delicatissima*) still live. The towns along the Atlantic coast, near Chancel island, the last isolated site of Martinique comprising exclusively the Lesser Antillean iguana, were also designated as priority sites.
- Informational efforts have already been made in other towns (Fort-de-France and Lamentin) in conjunction with particular events (e.g. Science Day) or in response to specific requests (e.g. assistance in management work on the Striped iguana).



1 - Map of towns on Martinique. The green zone indicates the priority towns for the conservation of the Lesser Antillean iguana. Source: Carbet des sciences, DEAL and ONF.

Disturbances and issues involved

- *I. delicatissima* is considered critically endangered worldwide on the IUCN red list, following a 70% decline in its population and a projected future decline of over 80%.
- The species has been protected on Martinique by ministerial decree since 1989 and that protection was expanded to include its habitat in 2019.
- It is one of the most threatened reptile species worldwide. Outside of Martinique, the species is now present only on a few isolated sites on Guadeloupe, Saint-Barthélemy, Dominica, Anguilla and Saint-Eustache.
- The last populations of *I. delicatissima* are confronted with a number of threats, e.g. degradation of feeding and nesting sites by introduced herbivores, such as sheep. Exogenous species such as rats, mongooses and chicken feed on the eggs and juveniles. What is more, since 2011, a bacteria (*Devriesea agamarum*) is prevalent among iguanas on Saint-Barthélemy and constitutes a risk for populations on small, isolated sites. Weather events such as dry periods and hurricanes also represent a threat, in particular for the population on Chancel island.
- The Striped iguana (also known as the Green or Common iguana), *Iguana iguana*, is an invasive alien species (IAS)

and the main threat to the survival of the endemic species (*Iguana delicatissima*), the Lesser Antillean iguana.

■ *I. iguana*, larger and more prolific, is a competitor of *I. delicatissima* for biotopes, food and reproduction. First-generation hybrids show a mix of the morphological and genetic characteristics of the two species, however, after a small number of generations, the far greater fertility of *I. iguana* results in descendants in which the morphological and genetic characteristics of *I. delicatissima* have virtually disappeared.

■ Generally speaking, *I. iguana* is a highly detrimental competitor for the other species of iguanas on the Antillean islands, such as the Blue iguana on Grand Cayman (*Cyclura lewisi*), the Lesser Caymans iguana (*Cyclura nubila caymanensis*), the Sainte-Lucie iguana (*Iguana iguana santaluciaae*) and its management requires a regional approach.

■ These herbaceous animals can live in highly dense population groups (over 5 000 iguanas per square kilometre on Grand Cayman in 2018) and have a major impact on the natural vegetation and crops. For example, on Porto-Rico, mangroves along the edge of the coast have been severely affected.

■ Health risks have not yet been extensively assessed, but due to the abundance of their droppings, a high concentration of animals in urban environments can cause sanitary problems.

■ Economic problems have also occurred, notably in Florida, and have drawn attention to the negative impacts caused by very dense populations. For example, the digging of nests can cause subsidence of roads and damage to dikes.

Interventions

■ Objectives

■ To raise awareness of the importance to preserve *I. delicatissima*, the need to inform the general public of the threat rapidly became clear. The informational tools and the messages had to present the two species. *I. iguana* is still too often considered an endemic and even a patrimonial species because it is often observed by the inhabitants of urban areas and due to false information circulating on the island.

■ One of the objectives of the informational caravan was to correct the false information in order to avoid any confusion between the two species. The main objectives were therefore to:

- present the two species and explain why the introduced species is a threat for the endemic species;
- make it easy for people to visually distinguish between the two species;
- encourage the public to report any striped iguanas observed in the priority towns in order to activate the surveillance network for a rapid intervention (gendarmes, fire departments, local governments) and to improve knowledge on the expansion of the species outside of Fort-de-France where its presence has already been clearly determined.
- make people understand that the management of *I. iguana* is part of an effort to preserve a native and endemic species that is gravely threatened. This effort is indispensable to help agents in their management work, particularly when capturing animals in areas with high-density iguana populations where uninformed observers may be upset.



2 - *Iguana delicatissima*.
 3 - *Iguana iguana* or the *Striped iguana* along a hotel pool.
 4 - False information that may have produced the confusion between the two species.



■ Discussions with the stakeholders

■ A steering committee comprising representatives of the National Forestry Agency (ONF, the organiser of the PNA for the Lesser Antillean iguana), the Environmental Directorate (DEAL, provisional organiser of the action plan against striped iguanas and head of the PNA for the Lesser Antillean iguana), non-profits working to inform via the network for the Lesser Antillean iguana (Sepanmar, Le Carouge and Karisko) and Carbet des sciences, held a meeting at the start of the project to discuss the choice of illustrations.

■ Numerous meetings took place with the Environmental Directorate, the National Forestry Agency and the Ardops Environnement engineering firm to validate the texts and the new common names assigned to the two species. Clarification of the names was necessary because a number of terms, often erroneous, are still used and contribute to the confusion. The common names were therefore modified to better distinguish between the two species and to create a more attractive name for the endemic species. That explains why:

- *Iguana iguana*, initially called the green or common iguana, is now called the Striped iguana due to the dark stripes on its tail;

- *Iguana delicatissima*, initially called the Lesser Antillean iguana, is now called the Péyi iguana.

These new names are now systematically used for the caravan and by all stakeholders.

■ The drafted documents were submitted to the steering committee for approval prior to printing.

■ Designing the caravan

■ The caravan was designed by the Carbet des sciences. The design phase lasted seven months.

■ Three people were involved in preparing the texts, the illustrations and the computer graphics:

- the project manager;
- an illustrator;
- a graphic designer.

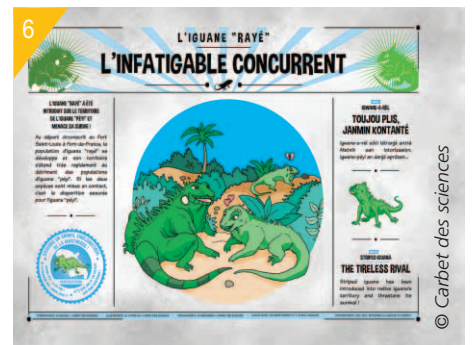
■ The French texts were translated into English by a secondary-school teacher and into Creole by an expert in the Creole language.

■ The caravan can be transported in a small to mid-sized car or a light commercial vehicle, and can be used both indoors and outdoors.

■ It can be set up in half an hour by two people. In the form of a square tent, it attracts the attention of people. A total surface area of approximately 12 square metres is necessary so that people can move around it. The ground must be flat, not exposed to strong winds (40 km/h max.) and public lighting is required if presentations after six o'clock in the evening are planned.

■ Three sides of the tent present artwork in a "newspaper" style with amusing illustrations and short texts. The topics are:

- the "tireless rival";
- the "West Indies outlaw";
- the "invader of the Antilles".



5 and 6 - The artwork displayed on the sides of the tent.

7 - A kakemono (vertical banner) used in the caravan.

Four kakemonos fill out the display with short texts and interesting illustrations designed to reinforce the information provided by the presenter. They are numbered one to four and constitute a logical chain of information to provide precise and factual answers:

- Chapter 1. The Péyi iguana, a patrimonial species in danger;
- Chapter 2. The Striped iguana, the main threat, but not the only one;
- Chapter 3. The Péyi iguana confronted with numerous other threats;
- Chapter 4. Help in preserving biodiversity on Martinique.

■ Training of presenters

■ To ensure good results, presenters received all the necessary technical and scientific knowledge and were trained on how to effectively deliver the messages to highly diverse audiences. The non-profit groups participating in the network for the Lesser Antillean iguana took part in a training program organised on 13 September 2019 by the Carbet des sciences. A number of other people were trained in the field by the project manager. A guide manual for presenters was drafted and given to the participants. DEAL, ONF and OFB employees also received training.

■ A total of 12 presenters took part in the caravan.

■ Events

Table 1. Number of presenters from the non-profit groups participating in the network for the Lesser Antillean iguana.

Non-profits	Carbet des sciences	Le Carouge	SEPANMAR	Karisko	Independent ecologists
Number of presenters	5	3	1	1	2

■ The operation began on 21 and 22 September 2019, during the European patrimonial days in Fort Saint-Louis, where the animals were initially introduced and from where they dispersed.

■ A total of 25 sessions, generally involving two presenters, were held on the island. They consisted of full-day or morning sessions, depending on the context. The team of presenters occasionally changed between morning and afternoon.

■ The sessions took place in four types of events:

- the European patrimonial days, major awareness-raising occasions;
- travel synchronised with other events in the priority towns for preservation of the péyi iguana to take advantage of the larger audiences;
- awareness-raising days combined with management work on striped iguanas organised by DEAL in conjunction with ONF and the Martinique regional nature park (PNRM) in order to facilitate the management work in public areas of Fort-de-France with high densities of the animals;
- other events such as the IAS workshop organised in February 2020 by the IUCN French committee to present the caravan to all overseas stakeholders confronted with invasive alien species.

■ The project manager created a work group using an instant messaging service to facilitate coordination.



8 - The caravan in the town of Morne-Rouge
 9 - The caravan at Fort Saint-Louis in Fort-de-France during the European patrimonial days.
 10 - The caravan in the town of Carbet.
 11 - The caravan in the town of Robert.



Results

■ Technical results

■ During the first year of the project, the caravan informed 4 863 people including 3 116 adults and 1 752 children. Intended as an informational campaign, it served to correct certain ideas and to introduce some nuance in the attitudes and opinions of the public. Less than 1% of the persons contacted disagreed with the information presented, most people were quite receptive.

Table 2. Session data and numbers of persons informed.

Date	Territory / Intermunicipal councils	Towns	Days	Man-days	Hours	Adults informed	Children informed	Total number of people informed
21/09/2019	Cacem	Fort-de-France	1	2	10	600	360	950
22/09/2019	Cacem	Fort-de-France	1	2	10	600	360	950
30/10/2019	Cap-Nord	Le Carbet	1	2	8	198	647	845
10/11/2019	Cap-Nord	Prêcheur	1	2	9	57	21	78
11/11/2019	Cap-Nord	Le Precheur	1	2	9	75	36	111
15/11/2019	Cacem	Le Lamentin	1	2	9	46	30	76
16/11/2019	Cacem	Le Lamentin	1	1.5	9	76	26	107
29/11/2019	Cap-Nord	La Trinité	0.5	1	5	32	12	46
01/12/2019	Cap-Nord	Grand'Rivière	1	2	6	22	7	30
08/12/2019	Cap-Nord	Ajoupa-Bouillon	1	2	6	24	3	28
20/12/2019	Cap-Nord	Le Lorrain	1	2	7	39	4	45
21/12/2019	Cap-Nord	Sainte-Marie	1	1	6.5	46	3	51
18/01/2020	Cap-Nord	Saint-Pierre	1	2	7	73	0	73
19/01/2020	Cacem	Le Lamentin	1	2	6	21	0	21
25/01/2020	Cap-Nord	Le Morne-Rouge	1	2	7	50	5	55
12/02/2020	Cacem	Fort-de-France	0.5	1	2	60	0	60
27/02/2020	Cacem	Fort-de-France	1	2	6	67	8	75
03/03/2020	Cacem	Fort-de-France	1	2	7	83	7	90
04/03/2020	Cap-Nord	Le Robert	1	2	9	58	15	73
27/06/2020	Cap-Nord	Grand'Rivière	0.5	2	5.5	40	0	40
16/07/2020	Cacem	Fort-de-France	0.5	2	3	15	15	30
29/07/2020	Cap-Nord	Robert	1	2	7	31	13	44
09/08/2020	Cap-Nord	Ajoupa-Bouillon	0.5	2	5	58	11	69
19/09/2020	Cacem	Fort-de-France	1	2	9.75	270	65	335
20/09/2020	Cacem	Fort-de-France	1	2	9.75	408	102	510
25/09/2020	Cacem	Schoelcher	1	1	7.25	67	2	69
TOTAL			23.5	44.5	172.25	3 116	1 752	4 863

Table 3. Distribution of man-days.

Le Carouge non-profit	10.5
Karisko non-profit	0.5
Sepanmar non-profit	2
Nathalie DUPORGE (independent)	4
Myriam BOUAZIZ (independent)	0.5
Marine DESCHERES (independent)	0.5
Carbet des sciences non-profit	26.5

- The start of the operation during the European patrimonial days in Fort Saint-Louis was a strategic decision in that, over two days, 1 900 people were informed in the main town where striped iguanas are observed and where the animals are seen favourably.
- During travel through the northern section of the island, 1 436 people in the priority towns for the preservation of the Péyi iguana were informed.
- The sessions synchronised with management work on striped iguanas in public places greatly facilitated the capture of the iguanas. The agents could calmly go about their work while the presenters occupied any inhabitants and tourists by explaining the situation and answering questions. Over the two days, 106 iguanas were captured on sites near the point of dispersal. Without the assistance of the caravan to occupy and inform the public, that number of animals could never have been captured.
- A long-term assessment will provide information on the effectiveness of the caravan in raising the awareness of the public and in increasing the number of reports. However, the presenters have already noted a positive impact on the frequency and content of comments on social networks. On the basis of those comments, the caravan would appear to be increasingly well perceived by inhabitants.
- Due to Covid, fewer people were informed during the two days in Fort-de-France in September 2020. The results were nonetheless encouraging, in spite of the unfavourable context, in that 845 people were informed.

Table 4. Design and operational costs of the caravan over the first year.

Items	Cost (€)
Design	11 000
Remuneration of three interns (illustrations, computer graphics, video clip), partial salaries of policy officer, assistant, project manager (FTE = full-time equivalents)	8 000
Equipment: Tent, kakemonos, table, bench, minor items	3 000
Sessions from September 2019 to September 2020	9 750
Coordination (FTE)	1 200
Remuneration of presenters (150 € per day)	6 750
Reimbursement of travel costs (40 € per day)	1 800
	20 750

■ Financial aspects

- Funding of phase 1. Design and sessions from September 2019 to March 2020
The design of the caravan and the informational sessions are part of a wider informational project to preserve the endemic iguana species of the Lesser Antilles, a project managed by Carbet des sciences with a total budget of 26 735 euros. The project was funded 95% by the French Biodiversity Agency (OFB) as part of a 2018 call for projects titled "Initiative to restore biodiversity overseas" and 5% by Carbet des sciences. The project, established taking into account the needs listed in the PNA for the Lesser Antillean iguana, included three main lines of communication:
 - **create and run a travelling caravan to raise awareness of the problems and issues involved in preserving the péyi iguana.** Two additional communication tools were created, namely a video clip and an information sheet presenting the issue;



- **raise awareness of tourist operators running "nature" excursions concerning good observation practices** via a training session, after which they received a "Trained Operator" sticker designating them as participating stakeholders in the PNA for the Lesser Antillean iguana. Prior to the start of the project, the Carbet des sciences updated the list of operators visiting Chancel Island as part of their excursions. The island, covered by a Biotope-protection decree, is home to the largest population of péyi iguanas. Following the training session, the Carbet des sciences ran a "mystery client" survey by telephone to assess the knowledge level of the trained operators and that of non-trained operators to adjust and clarify the training content;

- **activate or reactivate a surveillance network in the PNA priority towns** in the event a Striped iguana is observed in order to capture the animal(s) and, if necessary, dispose of them. The surveillance network comprises fire departments, the gendarmerie, municipal police, environmental agents and elected officials.

■ Funding of phase 2. Activities from July 2020 to October 2021

A funding agreement was signed between the National Forestry Agency (ONF) and the Carbet des sciences in order to pursue the activities. The total budget was 15 000 euros, with 90% provided by ONF and 10% by the Carbet des sciences.

Information on the project

■ The schedule for the caravan is announced on the Facebook page of the network for the Lesser Antillean iguana, which currently has 2 327 subscribers. The Carbet des sciences also publishes the schedule on its Facebook page (4 300 subscribers) and encourages the towns receiving the caravan to publish the information on their pages.

■ The information sheet drafted in conjunction with ONF and DEAL contains the essential information required to understand the issue and the management work. It was printed (A3 format) and sheathed in plastic as a poster to be given to tourist operators and used during training sessions. The sheet was published on the internet sites of the network for the Lesser Antillean iguana, the Carbet des sciences and the Martinique Biodiversity Observatory. It was also sent to the authors of tourist guides for Martinique. And finally, it is regularly sent out by email and published on the internet sites of local partners.

Outlook

■ The information sheet, printed in the smaller A5 format, can be used to communicate on the network for the Lesser Antillean iguana (caravan schedule, presentations in schools, etc.). It can also be distributed to hiking and running clubs.

■ Efforts to raise awareness of tourist operators will be pursued and expanded following a "mystery client" survey to identify prevalent opinions and adjust communication work. The initial results of the survey indicate that a two-hour presentation is not sufficient for operators to correctly transmit the information to the general public.

■ The Carbet des sciences contributed to setting up the surveillance network in the towns in the northern section of the island, as part of the implementation of the PNA for the Lesser Antillean iguana.



12 - Article on the work of the Carbet des sciences and ONF in setting up the surveillance network in the town of Prêcheur . Source: France Antilles.

13 - Post on social networks announcing the passage of the caravan.

- At the request of ONF, the Carbet des sciences adapted the caravan to the specific context of the Guadeloupean archipelago and the islands to the north (Saint-Martin and Saint-Barthélemy), in conjunction with the local stakeholders. These islands now have their own communication tool and the presenters were trained in November 2020.

- The caravan could potentially be used in many different forms to raise awareness on the need to preserve threatened species and on the management of invasive alien species (IAS). It would also be possible to design a caravan addressing the general topic of IAS management.

Regulations

- The introduction of the Striped iguana (*I. iguana*) on Martinique is prohibited by the ministerial decree dated 8 February 2018 on preventing the introduction and propagation of animal IASs on Martinique.

- The species is also on the list appended to the decree dated 7 July 2020 prohibiting the detention, transport, use and/or trade of IASs on Martinique.

- The species is named in the prefectural order dated 8 July 2013 authorising the capture and killing of certain IASs by certain competent organisations.

- The prefectural order dated 22 August 2019 authorises a specific list of environmental-protection groups, local governments and private structures to capture and kill striped iguanas.

Authors: Clara Singh, IUCN French committee, Mathilde Brassy (Carbet des sciences), Julie Gresser (DEAL Martinique), Fabian Rateau (ONF), Clarisse Courty (DEAL Martinique), for the IAS Resource Centre in conjunction with the Overseas IAS Initiative. April 2021. Editor: French Biodiversity Agency.

2022 edition

For more information...

- Signs posted on Chancel Island and in marinas in the towns of François and Robert.

<https://www.iguanesantilles.org/communication-1>

- Angin B., 2017. National action plan to restore the Lesser Antillean iguana, *Iguana delicatissima*, 2018-2022. Ardops Environnement, 67 pp + appendices. (In French)

- Angin B., 2018. Action plan against the green iguana (*Iguana iguana*) in the French Caribbean, 2019-2023. ONCFS and Ardops Environnement, 71 pp. (In French)

- Brassy M., 2020. Guide for presenters in the informational caravan for the network for the Lesser Antillean iguana (Martinique edition). Carbet des sciences. 27 pp. (In French)

<https://www.carbet-sciences.net/>

<https://www.iguanes-antilles.org/>

<https://www.facebook.com/CarbetDesSciences>

<https://www.facebook.com/iguanadelicatisima>



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